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ABSTRACT

A study examined students' ability to comprehend consistent or inconsistent text when activating relevant or irrelevant background knowledge. Fifty-five grade six students reading at or above grade level were randomly assigned to one of four treatment groups: activated/consistent, nonactivated/consistent, activated/inconsistent, and nonactivated/inconsistent. Activated subjects wrote down background knowledge related to a science textbook passage, while nonactivated subjects wrote down background knowledge for an unrelated subject. Subjects then read consistent or inconsistent forms of the science passage, and completed a multiple-choice comprehension test. Recall protocols were analyzed for gist recall, and multiple choice tests were scored according to text type. The results indicated that subjects who activated prior knowledge and then read consistent text comprehended more text information than subjects in other treatments, including those who activated relevant knowledge but read inconsistent text. The activation of relevant preexisting knowledge did not, however, facilitate learning from text that contained information incompatible with learners' prior knowledge. Subjects who did not activate relevant knowledge and yet read inconsistent text appeared to be more willing to accept textual incongruity, that is, were more text dependent, than those who had activated relevant knowledge. (HTH)

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EFFECTS OF ACTIVATING BACKGROUND KNOWLEDGE ON COMPREHENSION OF EXPOSITORY PROSE

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Recent research (e.g. Mayer, 1975; Pearson, Hansen, & Gordon, 1979; Reynolds, Taylor, Steffenson, Shirey, & Anderson, 1982) continues to confirm that background knowledge is a crucial component in the comprehension process. The meaningfulness of newly-acquired learning is dependent both upon the learner's intention to relate that new information to existing schemata and upon the ability of the learner to find the potentiality within the material to relate it to what is already known (Rumelhart, 1980).

Three major assumptions, concerning the relationship between prior knowledge and its effect on comprehension, have been supported in the extant literature. The first of these is the assumption that holding prior knowledge compatible with what is read in text enhances the comprehension

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of that text. Bartlett (1932) is generally given credit for initially recognizing this factor. Further credence in the assumption has been established through the work of Bransford and Johnson (1973) and Pearson, Hansen, and Gordon (1979) among others. The second assumption is that the child who has no prior knowledge, or assumes he has none, about a particular topic, will more likely attend to what is in the text (Lipson, 1982). Having no established reference point in schemata, the reader is willing to accept the text as is. Third, the assumption has been made that one who maintains prior knowledge incompatible with a particular text is likely to allow that prior knowledge to interfere with comprehension, that is, to override the textual information (Lipson, 1982, 1983; Maria & MacGinitie, 1982; Pearson, Hansen, & Gordon, 1979).

In contrast, Peeck, van den Bosch, and Kreupeling (1982), in studying the effects of activating prior knowledge by means of an activation protocol on the comprehension of text containing incompatible information, found that when students' prior knowledge was in conflict with text, the students remembered the textual information. That is, in their study, prior knowledge did not override incompatible text; rather, textual incompatibility facilitated recall. On the other hand, the activation of prior knowledge had no significant effect on the recall of compatible text information.

In an attempt to extend the Peeck et al. study, the present study was conceptualized. Using classroom text, this study focused on the interaction of prior knowledge activation with textual consistency and addressed the following major question: What differences exist in students' ability to comprehend text information when faced with either consistent or inconsistent text under activation or nonactivation conditions?

METHOD

Subjects

Fifty-five sixth-grade students from a middle class northeast Georgia community formed the sample group. The subjects, reading predominately at or above grade level as determined by standardized test scores and teacher judgment, were randomly assigned to one of four treatment groups (activated/consistent, nonactivated/consistent, activated/inconsistent, nonactivated/inconsistent).

Materials

The 205-word passage was drawn from an as-yet-untaught portion of the sixth-grade science book and was given the title, "How Insects and Birds Adjust to Their Environment." Two forms (consistent/inconsistent) of the passage were utilized; the inconsistent form included four concepts which had been changed from the natural (consistent) text so as to be inconsistent with prior knowledge. For example, in this sentence from the natural text, "However, the bumblebee has a stinger that can cause pain or death to other insects and birds," the phrase "has a stinger" was changed to the incongruous "makes a noise."

For the activation phase of the study, dual-sided activation protocols were used. On the front side of the protocol, the activating subjects wrote their background knowledge related to how insects use their body color and body parts to survive; on the reverse side they dealt with how birds utilize the same. The nonactivating subjects followed the same procedure except that the front side of their protocol addressed how volcanoes help and the reverse side how volcanoes destroy.

A multiple-choice test was developed which consisted of 12 questions, each with four answer choices. Four of the questions tapped the manipulated (congruous/incongruous) concepts and incorporated both forms of each concept with the answer possibilities.

Procedure

Simultaneously, though in separate rooms, all subjects were introduced to the activation procedure by responding orally with ideas related to an imaginary reading assignment concerning "The Dutch Farm."

With the exception of the multiple-choice test, the materials, classified by treatment group, had been sequentially placed in large manila envelopes, labelled by subject number, and were distributed to each subject.

During the activation phase, all subjects were given three minutes to write on each of the two topics assigned to their respective groups. Following activation, the subjects were told the title of the passage they would be reading, as well as that they would be asked to complete a recall protocol and a multiple-choice test after their reading. The subjects were allowed four minutes to read the passage; this was followed by a three-minute buffer activity.

Ten minutes were allotted for the free recall phase of the study. Subjects were instructed to be as accurate as possible in recalling all they could about the passage. The multiple-choice tests were then distributed to the subjects, who were allowed six minutes to complete the test.

Scoring

Recall protocols were analyzed for gist recall by two independent raters (95% agreement) using Johnson's (1970) procedure. Multiple-choice tests were scored according to text type, with each correct answer being worth one point.

RESULTS

A two-way analysis of variance (ANOVA), with text mode and activation mode as the between subjects factors and recall as the dependent measure, indicated no main effect for text, F (1,51) = 1.41, $p > .05$, or for activation mode, F (1,51) = .01, $p > .05$. There was, however, an interaction effect, F (1,51) = 8.15, $p < .05$. An analysis of simple effects indicated that activators reading consistent text recalled significantly more information (M = 12.14, SD = 3.63) than those not activating and reading consistent text (M = 8.54, SD = 4.01). Additionally, activators reading consistent text also recalled significantly more information (M = 12.14, SD = 3.63) than those activating but reading inconsistent text (M = 7.21, SD = 3.87).

A second two-way ANOVA with multiple-choice scores as the dependent measure indicated a significant main effect for text, F (1,51) = 12.53, $p < .05$, but not activation mode, F (1,51) = 1.97, $p > .05$. There was, however, an interaction, F (1,51) = 4.66, $p < .05$. An analysis of the simple effects indicated that the activators with consistent text correctly answered significantly more multiple-choice items (M = 10.07, SD = 1.94) than activators with inconsistent (M = 7.21, SD = 1.63). Furthermore, nonactivators reading inconsistent text answered significantly more

multiple-choice questions correctly (M = 9.00, SD = 1.96) than activators reading inconsistent text (M = 7.21, SD = 1.63).

DISCUSSION

The results of this study reveal that subjects who activated prior knowledge and then read consistent text did indeed comprehend more text information than subjects in the other treatments. This finding is by no means new.

Substantiating Mayer's (1979) assimilation encoding theory are the results indicating that those subjects who activated prior knowledge and then read consistent text did indeed comprehend more information than those failing to activate such knowledge (see also Pearson & Spiro, 1980). What is interesting, however, is that these same subjects performed better than those subjects who activated but read inconsistent text. Contrary to the findings of Peeck et al. (1982), the activation of relevant pre-existing knowledge did not, at least in this case, facilitate learning from text which contained information incompatible with learners' prior knowledge. As with Lipson's (1982) study, the subjects in this study appear to have allowed their previous knowledge and experience to override the inconsistencies in text. At the same time, at least in the recognition mode, subjects who did not activate prior knowledge and yet read inconsistent text appeared to be more willing to accept textual incongruity, that is, were more text-dependent, than those who had activated. While the extent of prior knowledge per se was not pretested in this study, this latter result may fit with Lipson's (1982) findings that readers without specific prior knowledge about a topic are more likely to believe the text than those with either correct or incorrect knowledge of the topic.

While this study needs replication across grade levels and with varying types of prose, textual incongruity did not serve as a springboard for better comprehension as Peeck et al. found. For the most part, subjects who did activate their prior knowledge concerning the text passage did indeed let that knowledge enter into their textual processing and did allow that knowledge to take precedence over textual information that was inconsistent with it.

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